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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/064,156   | 06/14/2002  | Wenhui Mei           | 22397.324           | 5103             |
| 27683  | 7590        | 11/01/2005           | EXAMINER            |                  |
| HAYNES AND BOONE, LLP<br>901 MAIN STREET, SUITE 3100<br>DALLAS, TX 75202 |             |                      | CABRERA, ZOILA E    |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2125                |                  |

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                   |  |
|------------------------------|--------------------------------------|-----------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/064,156 | <b>Applicant(s)</b><br>MEI ET AL. |  |
|                              | <b>Examiner</b><br>Zoila E. Cabrera  | <b>Art Unit</b><br>2125           |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7,8 and 11-15 is/are allowed.
- 6) ☒ Claim(s) 1-5, 9-10, 16-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Final Rejection*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 6 has been cancelled.

The rejection with respect to claims 1-5, 9-10 and 16-18 is maintained.

Claims 7-8 and 11-15 are allowed.

### *Claim Objections*

2. Claims 9-10 are objected to because of the following informalities: Claim 9 and dependent claim 10 thereof are depending on a cancelled claim 6. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

3. Claims 1-5, 9-10 and 16 rejected under 35 U.S.C. 102(e) as being anticipated by **Karin et al. (US 2003/0090772 A1)**.

Regarding claim 1, **Karin** discloses in an image system, a method for controlling a relative movement between a substrate being exposed and a head of the image system (Page 7, [0075]; Page 6, [0067], lines 8-16), the method comprising:

- moving the head relative to the substrate at a relatively fast speed while exposing a first portion of the substrate (Page 8, [0081], i.e., an area 100 is an area wherein scanning head 28 is accelerating **and/or** decelerating); and moving the head relative to the substrate at a relatively slow speed while exposing a second

portion of the substrate (Figs. 4a – 4c, Page 8, [0080]-[0082], i.e., please note that it has three areas left, right and center as shown in Figs. 4b-4c, dark areas on each side the head accelerates or decelerates. Therefore, the second portion may be either one of the edges); and providing an image to the head of the image system at a variable rate responsive to changes in the moving speeds ([0082], i.e., according to the variable velocity approach, decelerating and accelerating scanning head takes places over inspection region 88 during the scanning process. Implementation of this method requires adjusting the interval between exposures of light sensing system in order to maintain a substantially constant pixel size during the accelerating and decelerating of scanning head 28. Please note that the scanning takes place at a variable velocity and therefore the images would be provided at variable rate; [0023]) wherein the exposing of the first and second portions of the substrate occur during a first pass (Page 8 [0081], lines 7-12).

As for claims 2-5, **Karin** discloses,

- upon completion of the first pass, rotating the substrate relative to the head; and moving the head relative to the substrate while exposing a third portion of the substrate (Page 6 [0067], lines 8-16, i.e., stage 24 moves perpendicular to direction of elongation 27. Please note that it has to rotate otherwise it will scan the same line or path);
- moving the head relative to the substrate at a speed between the relatively slow speed and the relatively fast speed while exposing a third portion of the substrate

(Fig. 4a-4c; Page 7 [0079], lines 9-10, in area 94 scanning head moves at constant speed); wherein the exposing of the first, second, and third portions of the substrate occur during a first pass (Page 8, [0081], i.e., please note that it has three areas left, right and center as shown in Figs. 4b-4c, dark areas on each side the head accelerates or decelerates and center area moves at constant speed);

- the movement moves a scan line for undertaking a scanning exposure of the substrate (Figs. 3a-3b, element 76);
- the image system is a digital photolithography system (Page 7, [0075], i.e., exposing or scanning a wafer is part of a photolithography system).

As for claims 9-10, **Karin** discloses,

- rotating the substrate relative to a pixel panel of the digital photolithography system (Page 6 [0067], lines 8-16, i.e., stage 24 moves perpendicular to direction of elongation 27. Please note that it has to rotate otherwise it will scan the same line or path); scanning the third portion of the substrate at the first speed on a separate pass (Page 7, [0077], last three lines, scanning head moves for each journey or path in both directions and, as shown in Figs. 4a-4c, scanning head moves at constant speed in the whole area 94);
- the first, second, and third portions are different portions of the substrate (Figs. 4b-4c, areas 96, 98).

As for claim 16, the same citations applied to claim 1 above apply as well for this claim. Karin further discloses modifying the pixel panel at a relatively fast rate ([0082],

lines 4-19, i.e. adjusting of light system 22 takes place in order to maintain a constant pixel size during the accelerating and decelerating of scanning head 28). Karin further discloses modifying the pixel panel at a relatively slow rate ([0082], i.e., Intensity control of the scanning beam is required, since, at lower velocities the exposure of light sensing system 22 will be higher for the same beam intensity).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Karin et al. (US 2003/0090772 A1)** in view of **Ishikawa (US 6,251,550)**.

Regarding claim 17, **Karin** discloses the limitations of claim 16 above but fails to specifically disclose a deformable or digital mirror device. However, **Ishikawa** discloses a deformable or digital mirror device (Col. 2, lines 40-52). Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the scanning system of **Karin** with the system of **Ishikawa** because it would provide a significant performance improvement over conventional lithography systems (Col. 2, lines 46-57).

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Karin et al. (US 2003/0090772 A1)** in view of Applicants' admitted prior art (Page 1 of Specification).

As for claim 18, **Karin** discloses the limitations of claim 16 above but fails to disclose means for supplying data to the pixel panel while the pixel panel is being moved relative to the substrate, wherein a rate at which the data is supplied corresponds to the speed at which the pixel panel is being moved relative to the substrate. However, Applicants admit that "The rate at which the pixel panel can change states is often determined by the rate at which data can be supplied to the pixel panel". Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the scanning system of **Karin** and supply data to the pixel panel at a rate corresponding to the speed at which the panel is being moved or changed state as conventionally known in the art (Specification, [003]).

***Allowable Subject Matter***

6. Claims 7-8 and 11-15 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The allowability of the claims resides, at least in part, that the closest prior art of record **Karin et al. (US 2003/0090772 A1)** does not disclose or suggest, alone or in combination, the step of:

Regarding independent claim 7, **moving the substrate relative to the head at a third speed in a first direction and moving the head relative to the substrate at a fourth speed in the first direction while scanning the first portion of the substrate, wherein the first speed equals the sum of the third and fourth speeds; and moving the head relative to the substrate at a fifth speed in a second direction opposite to the first direction while scanning the second portion of the substrate,**

**wherein the second speed equals the difference of the third and fifth speed, in combination with the other elements and features of the claimed invention.**

As for independent claim 11, **the substrate constantly moves at a third speed in the first direction during exposing, and the third speed is greater than the second speed, in combination with the other elements and features of the claimed invention.**

### ***Response to Arguments***

7. Applicant's arguments filed August 12, 2005 have been fully considered but they are not persuasive. Regarding claim 1, Applicant contends that Karin does not disclose "providing an image to the head of the image system at a variable rate responsive to changes in the moving speeds". Examiner disagrees because Karin discloses providing an image to the head of the image system at a variable rate responsive to changes in the moving speeds ([0082], i.e., according to the variable velocity approach, decelerating and accelerating scanning head takes place over inspection region 88 during the scanning process. Implementation of this method requires adjusting the interval between exposures of light sensing system in order to maintain a substantially constant pixel size during the accelerating and decelerating of scanning head 28. Please note that the scanning takes place at a variable velocity and therefore the images would be provided at variable rate; [0023]).

Regarding claim 16, applicant contends that Karin does not disclose "modifying the pixel panel at a relatively fast rate" and "a relatively slow rate". Examiner disagrees because Karin discloses modifying the pixel panel at a relatively fast rate ([0082], lines



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4-19, i.e. adjusting of light system 22 takes place in order to maintain a constant pixel size during the accelerating and decelerating of scanning head 28). Karin further discloses modifying the pixel panel at a relatively slow rate ([0082], i.e., Intensity control of the scanning beam is required, since, at lower velocities the exposure of light sensing system 22 will be higher for the same beam intensity).

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Conclusion***

8. Any inquiry concerning communication or earlier communication from the examiner should be directed to Zoila Cabrera, whose telephone number is (571) 272-3738. The examiner can normally be reached on M-F from 8:00 a.m. to 5:30 p.m. EST (every other Friday).

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If attempts to reach the examiner by phone fail, the examiner's supervisor, Leo Picard, can be reached on (571) 272-3749. Additionally, the fax phones for Art Unit 2125 are (571) 273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist at (703) 305-9600.

A handwritten signature in black ink, appearing to read 'Zoila Cabrera', with a stylized flourish at the end.

Zoila Cabrera  
Patent Examiner  
10/31/05